Listing of Claims:

1-7. (Canceled)

8. (Previously Presented) A method of maintaining milk production in a dairy cow fed a low phosphorus diet, comprising the steps of:

replacing all inorganic phosphorus in a diet for a lactating dairy cow with an effective amount of a 1α-hydroxylated vitamin D compound; and

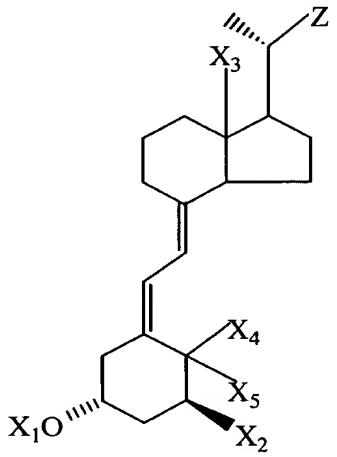
feeding said diet to said dairy cow.

9. (Previously Presented) The method of claim 8 wherein said diet includes a feed, and said 1α-hydroxylated vitamin D compound is fed as a top dressing on said feed.

10. (Previously Presented) The method of claim 8 wherein said effective amount of the 1α-hydroxylated vitamin D compound comprises about 0.1μg/kg to about 100μg/kg of diet.

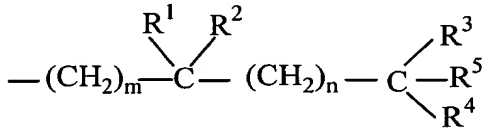
11 (Previously Presented) The method of claim 8 wherein said diet includes a feed, and said feed contains 0% by weight of an inorganic phosphorus supplement.

12. (Previously Presented) The method of claim 8 wherein said 1α-hydroxylated vitamin D compound is characterized by the following general structure:



where X_1 may be hydrogen or a hydroxy-protecting group, X_2 may be hydroxy, or protected hydroxy, X_3 may be hydrogen or methyl, X_4 and X_5 each represent hydrogen or taken together X_4 and X_5 represent a methylene group, and where Z is selected from Y,

-OY, -CH_2OY, -C≡CY and –CH=CHY, where the double bond may have the cis or trans stereochemical configuration, and where Y is selected from hydrogen, methyl, -CR_5O and a radical of the structure:



where m and n, independently, represent integers from 0 to 5, where R^1 is selected from hydrogen, hydroxy, protected-hydroxy, fluoro, trifluoromethyl, and C_{1-5}-alkyl, which may be straight chain or branched and, optionally, bear a hydroxy or protected-hydroxy substituent, and where each of R^2, R^3 and R^4, independently, is selected from hydrogen, fluoro, trifluoromethyl and C_{1-5} alkyl, which may be straight-chain or branched, and optionally bear a hydroxy or protected-hydroxy substituent, and where R^1 and R^2, taken together, represent an oxo group, or an alkylidene group, $=CR_2R_3$, or the group $–(CH_2)_p$-, where p is an integer from 2 to 5, and where R^3 and R^4, taken together, represent an oxo group, or the group $–(CH_2)_q$-, where q is an integer from 2 to 5, and where R^5 represents hydrogen, hydroxy, protected-hydroxy, or C_{1-5} alkyl.

13. (Previously Presented) The method of claim 8 wherein the vitamin D compound is 1α-hydroxyvitamin D_3.

14. (Previously Presented) The method of claim 8 wherein the vitamin D compound is 1α,25-dhydroxyvitamin D_3.